

The FRASCA 141

THE NEW MULTI-MICRO PROCESSOR DRIVEN SIMULATOR

COMPUTER GENERATED SIMULATION (CGS)



STATE-OF-THE-ART COMPLEX SINGLE ENGINE SIMULATOR

The Frasca Model 141 is an advanced state-of-the-art single engine flight simulator. The 141 was designed to span the entire training spectrum from the pre-solo primary student to the advanced commercial instrument or ATP pilot.

Frasca's new Computer Generated Simulation (CGS) technology is a completely new approach to low-cost simulation. It is based on computer applications technology unduplicated in any other competitively priced flight simulator on the market. The new digital multi-processor design does computations at 32 times per second. This makes the 141 simulator the most responsive of its kind available. We are proud to say that our new 141 series can handle the same sort of complex flight equations now being done on multi-million dollar simulators.

The 141 Flight Simulator

ADVANCED NAVIGATION SYSTEM

One of the many advantages of the new 140 series multi-processor architecture is an expanded navigation system. The new nav set-up lets the user select over 300 stations and navigate in an area of 1,000 x 1,000 nautical miles and even that is expandable. The system is completely user-programmable. That means the instructor can create any navigation area in the world and make subsequent changes and updates through the terminal. Station programming variables include type, ident code, magnetic variation, range, frequency, location, elevation, runway bearing, runway length, and glideslope angle.

Changes in navigation aids do not require that you purchase expensive eproms from the manufacturer.

NAVIGATION SYSTEM FEATURES

- It covers one million square miles
- User-programmable (customer can program stations)
- Over 300 Ground Stations
- Station data stored in non-volatile memory
- Station idents are simulated
- VHF station range varies with altitude
- Low frequency station range is set for each station
- Fan markers are simulated
- Glideslope angle is programmable for each station
- Instructor can fail any ground station
- Magnetic variation and field elevation automatically change when flying into a new area
- DME stations ident once every 30 seconds
- Simulator can be located relative to any station by entering its ident code
- All navigation receivers can be failed
- Middle and outer markers are simulated
- DME displays ground speed and time to station
- Area navigation is included with the King KNS 81 RNAV computer

FLIGHT COMPUTER PERFORMANCE CAPABILITIES

The 141 features Frasca's new high technology **Computer Generated Simulation (CGS)**. It is a system unduplicated in the industry—so unique and flexible that no other system even comes close. It's based on state-of-the-art high speed digital computers—simple in design but able to deliver more of the capability you need in a flight simulator.

The real measure of any flight simulator is accurate instrument performance. You sense accuracy during start-up procedures and taxi maneuvers. Take-offs and landings are realistic and that's just the beginning. Control response varies with air speed all the way down to minimum controllable air speed, just as it would in actual flight. Stalls are accurately simulated with stall speed varying according to angle of bank and degree of flap extension.

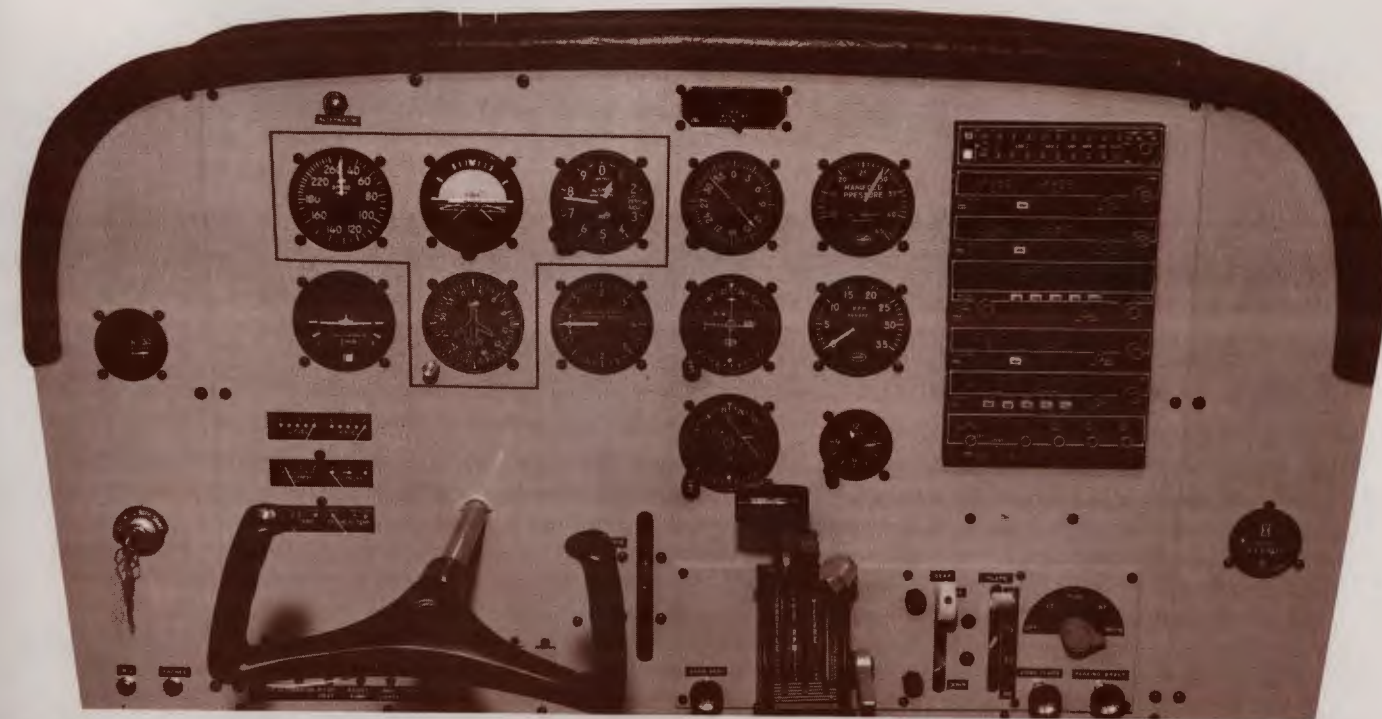
Once airborne, elevator trim neutralizes control pressure. For any given angle of bank, rate of turn is inversely proportional to air speed. Flight on the back side of the power curve is very realistic. Changes in gross weight and the center of gravity (manipulated from the instructor's computer terminal) affect flight response and stability.

True air speed and total performance are sensitive to altitude. Unlike many systems, the Frasca systems computes total thrust based on manifold pressure and RPM.

Also included is a system for duplicating phugoid oscillation or inherent stability. In short, we designed a system that gives you the features you need to maximize teaching potential.

COMPUTER INTERACTIVE TRAINING

One of the more exciting options is the ability of the 141 to be linked, through its RS 232 interface to a personal computer. The PC, along with optional software allows computer interactive training which, prior to this time, has not been available in cost-effective simulators. Computer directed teaching can relieve the instructor of teaching routine procedures that require repetitive practice. Computer grading of performance is another benefit which removes the variables that exist from one instructor to another. The ability to record and play back a student's flight in the 141 has obvious advantages. A graphics display, showing both a vertical and horizontal depiction of an approach can be a invaluable teaching aid. The customer can, if he desires, write his own software. Call or write for more information.



COCKPIT EQUIPMENT

- Compass
- Combination magneto and starter switch
- Microphone and headphone jacks
- Master switch
- Alternator switch
- Pitot heat switch
- Boost pump switch
- NAV light switch
- Strobe light switch
- Avionics master switch
- Left and right fuel quantity indicators
- Fuel pressure indicator
- Oil pressure indicator
- Oil temperature indicator
- Cylinder head temperature indicator
- Alternator warning light

- Airspeed indicator
- Artificial horizon
- Altimeter
- Turn and slip indicator
- Directional gyro
- Vertical speed indicator
- DME indicator
- ADF indicator
- NAV 1 indicator
- NAV 2 indicator
- Manifold pressure indicator
- RPM indicator
- Clock
- Audio control panel (KMA24)
- COM 1 transceiver (KY196)
- COM 2 transceiver (KY196)
- NAV 1 receiver (KNS81)

- NAV 2 receiver (KN53)
- ADF receiver (KR87)
- Transponder (KT76)
- Trim indicator
- Trim control
- Carb heat control
- Throttle control
- Propeller control
- Mixture control
- Landing gear control and indicators
- Flap control and indicator
- Fuel selector
- Cowl flap control
- Parking brake control
- Control yoke
- Rudder pedals and toe brakes
- Hobbs meter

FRASCA

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INSTRUCTOR CONTROLS

The instructor's station is designed to keep the work load to a minimum. All commonly used controls are located on a control panel. Additional specific controls or failures are activated through the computer terminal. The X-Y plotter gives the instructor a real-time display of the simulator's ground path.

CONTROL PANEL

The instructor's control panel has the following controls:

- Power switch—controls all simulator power
- Indicator light—illuminates when power is on
- Freeze switch—used to freeze the simulator's position and attitude
- Slew control—2-axis joy stick is used to allow the instructor to control the simulator's X-Y position, altitude, heading, or pitch and bank
- Slew select—rotary switch selects the slew control function
- Reset button—resets all failures and variables to normal
- Volume control—sets the instructor's intercom volume
- Transmit selector—switch controls which receiver the instructor can be received on

- Speaker switch—when off, the instructor speaker is muted and audio from the cockpit can be heard only on the headphones
- Plotter switch—when off, plotter will not operate
- Engine sound volume—control sets engine sound level
- Microphone and headphone jacks

COMPUTER TERMINAL

Despite the fact that the new Frasca 141 is an extremely sophisticated all digital simulator, you need not be a computer expert to operate it. The computer terminal displays a user-friendly menu driven program in plain english which the instructor uses to interact with the simulator. On power-up, the terminal displays a list of categories. The instructor can select any category and with one stroke on the keyboard, a list of options (failures) for that particular category is displayed. Over 60 variables and failures are controlled through the terminal.

PLOTTER

An X-Y plotter provides both hardcopy and a real-time display of the simulator's ground path. Both scale and reference station within the navigation area can be selected by the instructor through the computer terminal.

OPTIONAL EQUIPMENT

You can order your Frasca 141 with options. Special configuration or equipment are usually no problem. Here is a list of normal options to choose from.

- Computer interactive training package
- Computer generated color visual system (late 1984)
- Dual needle RMI
- Glide slope on NAV 2
- King KCS55A compass system HSI
- King KFC200 flight director (includes KCS55A)
- Fuel flow
- EGT
- Millibars on altimeter (inches standard)
- Turbocharged engine
- turn coordinator (replaces needle and ball)
- Spares and tool kit

POWER REQUIREMENTS

110V or 220V at 60 or 50 Hz. Total power consumption is less than 360 watts.

PRICES

Price schedules and other information available upon request.

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